

Syllabus for Bioinformatics (BIF) Course for B.Sc programme under semester scheme
Course:- Bio-informatics (BIF) (Credits: Theory-4, Practicals-2)

Semester III **Course Title: Bioinformatics and Computational Biology**

UNIT-I

Introduction to Bioinformatics, Importance of Bioinformatics. Relationship of Bioinformatics with molecular biology. Applications of Bioinformatics, Bioinformatic resources- NCBI, EBI, ExPASy, Entrez, PDB, SWISSPORT, TREMBL.

UNIT-II

General Introduction of Biological Databases; Nucleic acid databases (NCBI and EMBL), Protein sequence databases (UniProt and PROSITE), Protein structure databases (PDB, CATH),

UNIT-III

General introduction to gene expression in prokaryotes and eukaryotes, Transcription factors binding site, SNP, EST, STS. Genome Mapping, Gene Prediction, Multiple Sequence Alignment, Protein Sequence Analysis, Interpretation of Genetic data.

UNIT-IV

Introduction to Sequences and Sequence analysis: Sequence alignment, pairwise (BLAST and FASTA Algorithm), and multiple sequence alignment (CLUSTALW, TCOfee): local and global alignment.

PRACTICALS

1. Searching on internet, using email,
2. Downloading and installing softwares.
3. Hands on session with, SWISS-PDB.
4. Finding information in online databases.
5. Hands on session with NCBI, Genbank, Expasy,PDB.

REFERENCES

- Basic Bioinformatics - S. Ignacimuthu
- Introduction to Bioinformatics: A Theoretical and Practical Approach
- Introduction to Bioinformatics- Tramontano, A Chapman & Hall
- Understanding Bioinformatics- Zvelebil, M. and Baum, J.O Taylor and Francis.
- Introduction to Bioinformatics - Teresa K. Attwood, David Parry-Smith

